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FINAL STATEMENT OF REASONS

CALIFORNIA CODE OF REGULATIONS

Article 1. Definitions, Section 2300
Article 3. Work Procedures, Sections 2320.2, 2320.7, and 2320.8; and
New Section 2320.11
Article 4. Requirements for Electrical Installations, Section 2340.17
of the **Low-Voltage Electrical Safety Orders**

Article 1. Definitions, Section 2700
Article 29. Capacitors, Sections 2887 and 2893
Article 36. Work Procedures and Operating Procedures, Sections 2940, 2940.1, 2940.2, 2940.5, 2940.6, 2940.7, and 2940.8; New Sections 2940.11, 2940.12, 2940.13, 2940.14, 2940.15, 2940.16, 2940.17, 2940.18, and 2940.19; Sections 2941, 2941.1, and 2943; New Section 2943.1; Section 2944; New Section 2944.1 and Section 2945; New Appendix A, Appendix C, New Appendix D, and New Appendix E
Article 37. Provisions for Preventing Accidents Due to
Proximity to Overhead Lines, Section 2946
Article 38. Line Clearance Tree Trimming Operations, Section 2951
of the **High-Voltage Electrical Safety Orders**

Article 7. Miscellaneous Safe Practices, Section 3314
Article 10. Personal Safety Devices and Safeguards, Section 3389
Article 12. Tree Work, Maintenance or Removal, Sections 3422 and 3425;
and New Section 3428
Article 108. Confined Spaces, Section 5156
of the **General Industry Safety Orders**

Article 1. Telecommunications, Section 8617
of the **Telecommunications Safety Orders**

Electric Power Generation, Transmission, and Distribution; Electrical Protective Equipment: Final Rule

MODIFICATIONS AND RESPONSE TO COMMENTS RESULTING FROM THE 45-DAY PUBLIC COMMENT PERIOD

There are no modifications to the information contained in the Initial Statement of Reasons except for the following non-substantive, substantive, and sufficiently-related modifications that are the result of public comments and/or Board staff evaluation.

Section 2300. Definitions.

The proposal is modified as follows:

- To delete the proposed new definition "Competent Supervision". The proposed change to use the term "competent supervision" instead of "responsible supervision" in Section 2320.2 is being withdrawn; therefore, the definition is no longer needed. See the proposed modifications in Section 2320.2.
- To add the definition of "Fall Protection" to be defined as "any equipment, device, or system that prevents an employee from falling from an elevated location or mitigates the effect of such a fall". This new definition is derived from the federal standard, 29 CFR 1910.21(a). The addition of the term "fall protection" is necessary because the term "fall protection" is used in Section 2320.8.
- To modify the proposed definition of "Minimum Approach Distance" by adding the word "exposed" prior to the word "energized" and deleting the words "or a grounded" prior to the word "object" from the definition. The term "exposed" is necessary to add clarity. Section 2300 defines "Exposed" as "(As applied to live parts.) Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated". The term "minimum approach distance" is used in Section 2320.2.

  The proposed inclusion of "grounded" in the definition is not necessary because the Electrical Safety Orders do not have standards pertaining to barehand live-line work. The modification to delete the term "grounded" will be consistent to the regulatory policy that prohibits barehand liveline work practices without a permanent variance.

Section 2320.2. Energized Equipment or Systems.

The proposal is modified as follows:

- To delete the proposed change to use the term "Competent supervision" instead of "Responsible supervision". Upon further review, the Board has determined that the wording "responsible supervision" as used in Section 2320.2(a)(1) provided sufficient clarity to communicate the intent of the safety order, which is, energized work cannot proceed until a supervisory employee representing the employer has made the determination that the work must be performed while energized. Therefore, no modification to the existing language is necessary.
- To delete the original proposed "EXCEPTION" to subsection (b), which allows the employee to deviate from the order of making electrical connections. It is necessary to

withdraw the proposed exception because adding the exception would have rendered the proposal to be not as effective as the federal standard, 29 CFR 1910.269(l)(6). Board staff proposed the modification in consultation with Federal OSHA.

- To add the word "exposed" in front of energized parts to clarify that the minimum approach distance requirements apply to exposed or unguarded energized parts.

Section 2320.8. Fall Protection.

The proposal is modified as follows:

- To add the phrase "fall restriction equipment" as a means of providing fall protection. This modification is necessary to clarify that wood pole fall restriction equipment is an acceptable type of personal protective equipment to mitigate the effects of a fall.
- To add new subsection (a)(1) to clarify that personal fall arrest systems are required to meet Section 1670(b) of the Construction Safety Orders. A cross-reference to Section 1670(b) is necessary to lead the reader to the section that contains the requirements for personal fall arrest systems.
- To renumber proposed subsection (a)(1) to subsection (a)(2) to accommodate the proposed modification stated above.
- To renumber the EXCEPTION to subsection (a)(1) to subsection (a)(2) to reflect the renumbering of subsection (a)(1) to subsection (a)(2).
- To add new subsection (b) to be consistent with Section 2940.6(c) of the High-Voltage Electrical Safety Orders. This modification is necessary to provide continuity and consistency to the use of personal fall arrest equipment. Employees will be wearing the same fall arrest equipment as they move from working with low-voltage circuits to high-voltage circuits at elevated locations. The fall protection personal protective equipment for employees who work on high-voltage (above 600 volts) will be the same as electricians or linemen who work on low-voltage equipment at elevated locations.

Section 2320.11. Protection From Flames and Electric Arcs.

The proposal is modified as follows:

- To modify subsection (b) to clarify that the employer shall not select apparel that would not melt on the employee's skin. The modification is necessary to prevent confusion. The current proposed language can be interpreted as the employer shall not select apparel that could melt onto the employer's skin.
- To modify the heading of subsection (d) to "Energized Covered (Noninsulated) Conductors" instead of "Covered (Noninsulated) Conductors" for clarity. For consistency, a modification is proposed to include the same term "energized covered (noninsulated)" in the regulatory text of subsection (d). This modification is necessary because the hazard this subsection is referring to is due to working near live or energized covered noninsulated wires. The word "covered" is defined in Section 2300 as a conductor encased within material of composition or thickness that is not recognized by these safety orders as electrical insulation.

Section 2700. Definitions.

The proposal is modified as follows:

- To add the definition of "Fall Protection" to be defined as "any equipment, device, or system that prevents and employee from falling from an elevation or mitigates the effect of such a fall". This definition is derived from the federal standard, 29 CFR 1910.21(a). This definition is the same definition as modified in Section 2300.
- To modify the proposed definition of "Minimum Approach Distance" by adding the word "exposed" prior to the word "energized" and deleting the words "or a grounded" prior to the word "object" from the definition. The term "exposed" is added for clarity. Section 2300 defines "Exposed" as "(As applied to live parts.) Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated". The inclusion of "grounded" in the definition is not necessary because the Electrical Safety Orders do not have standards pertaining to barehand live-line work. Including "grounded" in the definition may mislead the reader into thinking that barehand live-line work is permitted in California without a permanent variance.

Section 2874. General.

The proposal is modified as follows:

- To delete proposed new subsection (f) and relocate the proposed text to the appropriate Article 36. Work Procedures and Operating Procedures. The proposed text concerning work procedures is relocated to proposed new Section 2940.18. Current Transformer Secondaries. This modification is necessary in order for the provisions to apply to employees in the power generation, transmission, and distribution industry. Section 2706(a)(2) exempts the power generation, transmission, and distribution industry from the High-Voltage Electrical Safety Orders except for Articles 36 and 38. Board staff proposed the modification in consultation with Federal OSHA.
- To relocate subsections (g)(1) to (g)(2) to proposed new Section 2940.19 in Article 36. Work Procedures and Operating Procedures. This modification is necessary in order for the required work procedures to apply to employees who work in the power generation, transmission, and distribution industry. Section 2706(a)(2) exempts the power generation, transmission, and distribution industry from the High-Voltage Electrical Safety Orders except for Articles 36 and 38. Board staff proposed the modification in consultation with Federal OSHA.

Section 2887. General.

The proposal to amend the scope of Article 29. Capacitors, is proposed to be withdrawn because the proposed changes to Section 2893 is proposed to be relocated to Article 36. Work Procedures and Operating Procedures. Therefore, the proposed revisions to the scope is no longer necessary.

Section 2893. Disconnecting Capacitors and Means of Discharge.

The proposal is modified to delete the contents of the entire section and to relocate the current proposed language in Section 2893 to proposed new Section 2940.17 in Article 36. Work Procedures and Operating Procedures. This modification is necessary in order for the provisions to apply to all, including employees in the power generation, transmission, and distribution industry. Section 2706(a)(2) exempts the power generation, transmission, and distribution industry from the High-Voltage Electrical Safety Orders, except for Article 36 and 38. Board staff proposed the modification in consultation with Federal OSHA.

Section 2940. General Provisions.

The proposal is modified as follows:

- To add new subsection (g) regarding job briefings in order to improve communication. New subsection (g) contains requirements regarding job briefings before each job, subjects to be covered, number of briefings, and the extent of briefings that includes circumstances where there is a need for extensive discussion. Board staff, in consultation with Federal OSHA, added new subsection (g) in order to be as effective as the federal standard, 29 CFR 1910.269(c).

  New subsection (g)(1) requires that a job briefing be performed before a start of each job. The employer is required to provide the person in charge with all the information listed in proposed subsection (f). The person in charge is then required to communicate the information to employees who will be performing the work.

  New subsection (g)(2) contains a list of subjects to that are required to be cover such as the hazards associated with the job, work procedures, special precautions, energy-source control, and required personal protective equipment.

  New subsection (g)(3) requires that at least one job briefing before the start of the first job of each day or shift for repetitive or similar work and additional job briefings for when there is a significant change to the work that may affect the safety of the employees.

  New subsection (g)(4) allows for a brief discussion if the work is routine and the hazards can be reasonably expected to be recognized. A more extensive or detailed discussion is required for more complicated and hazardous work or if the employee cannot be expected to recognize or avoid the hazards involved in the job.

- To renumber proposed subsection (g) to proposed subsection (h) to accommodate the modifications above.

Section 2940.2. Minimum Approach Distance.

The proposal is modified as follows:

- To modify subsection (a)(1)(A) by adding "for voltages over 72.5 kilovolts, the employer shall determine the maximum" before the word "anticipated" to correct an inadvertent typographical error.
- To modify Table 2940.2-1 to correct a typographical error to calculate the minimum approach distance for phase to phase systems of voltages of 5.1 kV to 72.5kV. The "k" for kilo was inadvertently omitted.
- To delete "bare-hand" from the Footnote Number 1 of Table 2940.2-6 because Section 2940.2 does not apply to bare-hand live-line work. California does not permit bare-hand live-line work without a variance.

Section 2940.5. Work Over or Near Water.

The proposal is modified to add a cross-reference to Section 1602 for construction work over or near water, in addition to the cross-reference to Section 3389 for general industry. This modification will provide the correct cross-reference for work over or near water in construction.

Section 2940.6. Tools and Protective Equipment.

The proposal is modified as follows:

- To use the term "rubber insulating gloves" instead of "rubber gloves" in subsection (a)(2). Rubber insulating gloves is a more appropriate term because it describes the purpose of the gloves. Using the term "rubber insulating gloves" is consistent with the term used in a national consensus standard, Standard Specification for Rubber Insulating Gloves, ASTM D120-09.
- To list additional storage conditions that would deteriorate the gloves in subsection (a)(7). Board staff modified the proposal in consultation with Federal OSHA to be as effective as the federal standard, 29 CFR 1910.37(c)(2)(vi). The additional conditions are necessary to better inform readers of storage conditions to avoid because it can deteriorate rubber insulating gloves and affect the equipment's performance or insulating properties.
- To add the phrase "fall restriction equipment" in subsection (b) as a means of providing fall protection. This modification is necessary to clarify that wood pole fall restriction equipment is an acceptable type of personal protective equipment to mitigate the effects of a fall.
- To add a cross-reference in new subsection (b)(1) stating that personal fall arrest systems shall meet the requirements of Section 1670 of the Construction Safety Orders in order to be as effective as the federal standard, 29 CFR 1910.269. This modification is necessary in order to direct the readers to the section that contains specifications for personal fall arrest system.
- To renumber originally proposed subsection (b)(1) to subsection (b)(2) to accommodate the addition of new subsection (b)(1).
- To renumber the reference to subsection (b)(1) to subsection (b)(2) in the EXCEPTION to reflect the renumbering of subsection (b)(1) to subsection (b)(2). In addition, it is proposed to modify the EXCEPTION to subsection (b)(2) to include the phrase "the use of" prior to the words "fall protection" and to include the word "equipment" after the

words "fall protection" to read as "….. the use of fall protection equipment ……" to clarify that the use of fall protection is referring to equipment. This modification is necessary to grammatical improve the meaning of the EXCEPTION.

- To modify the heading of subsection (c) to include fall restriction equipment. This modification is necessary to reflect the contents of subsection (c).
- To modify the edition of the consensus standard proposed to be incorporated by reference by replacing ASTM F887-12 with ASTM F887-04 in subsection (c)(2). ASTM F887-04 contains specifications that are deemed sufficient to be as effective as the federal standard, 29 CFR 1910.269(g)(2)(iii). This modification will prevent the unnecessary retirement of in-service personal protective equipment that meets the requirements of ASTM F887-04.
- To add new subsection (c)(3) to require that fall restriction equipment meets the requirements of ASTM F 887-10, which is incorporated by reference. ASTM F887-10 is the first edition that covered fall restriction equipment.
- To renumber subsequent subsections after including proposed new subsection (c)(3).
- To improve clarity and organization by grouping all the requirements for non-specialized portable ladders in subsections (d)(1) to (d)(3) and to add subsection (d)(4) to apply to special portable ladders and platforms used for overhead line work.

The following are proposed modifications to subsection (d):

  - To add new subsection (d)(1) which states that the requirements for portable ladders are contained in Section 3276 of the General Industry Safety Orders apply, except for the requirements listed in subsection (d)(4).
  - To renumber existing subsection (d)(1) to subsection (d)(2) as the result of new subsection (d)(1).
  - To renumber existing subsection (d)(2) to subsection (d)(3) as the result of new subsection (d)(1).
  - To delete existing subsection (d)(3) because Section 3276 already requires that portable ladders be secured.
  - To add new subsection (d)(4) which will contain all the requirements for special ladders and platforms used for overhead line work. The new heading is entitled "Special ladders and platforms used for overhead line work". This modification to add a subsection (d)(4) is necessary to avoid confusion by differentiating between general portable ladders and special portable ladders and platform for overhead line work.
  - To relocate originally proposed subsection (d)(4) to new subsection (d)(4)(A) because new subsection (d)(4) refers to special ladders and platforms used for overhead line work.
  - To relocate originally proposed subsections (d)(5) and (d)(6) to new subsections (d)(4)(B) and (d)(4)(C), respectively, because these provisions are for special ladders and platforms for overhead line work.
  - To add new subsection (d)(4)(D) to require that ladders and platforms shall be secured to prevent them from becoming displaced. This modification is necessary to ensure that the special ladders and platforms are secured in order to prevent falls.

- To correct a grammatical error in omission in subsection (e)(3)(D) by adding the phrase "the test method shall verify".
- To add a requirement that hydraulic and pneumatic tools shall not be operated above the maximum rated operating pressure in subsection (g)(4) to be equivalent to the federal standard, 29 CFR 1910.269(i)(4)(i). Board staff proposed the modification in consultation with Federal OSHA. To add text requiring that "hydraulic and pneumatic tools shall not be operated above maximum rated pressure" is necessary in order to be as effective as the corresponding federal standard. The proposed text in subsection (g)(1) requiring that all valves, pipes, non-conductive hoses, filters, and fittings shall have adequate strength for normal operating pressure is not equivalent to the federal standard.
- To renumber proposed subsection (g)(4) to subsection (g)(5) as result of new subsection (g)(4).
- To restructure the sentence of proposed subsection (k) for clarity and to add polypropylene as one of the fabric or fabric blends that cannot be used unless the employer, and not the employee, can demonstrate that the fabric is treated with a flame retardant. The modification to add polypropylene is necessary because polypropylene is a type of fabric that could melt onto the employee's skin.

Section 2940.7. Mechanical Equipment.

The proposal is modified as follows:

- To substitute the phrase "Each day, prior to use" with the phrase "Prior to use on each shift", which may increase the frequency of inspections and operational checks of mechanical equipment depending on the number of shifts. This modification will render the proposal to be as effective as the federal standard, 29 CFR 1910.269(p)(1)(i). Board staff proposed this modification in consultation with Federal OSHA.

Section 2940.10. Medical Service and First Aid-Additional Requirement for Power Generation, Transmission, and Distribution.

The proposal is modified as follows:

- To correct the existing numbering format of subsections (a)(2)a., (a)(2)b., (a)(2)c. to subsections (a)(2)(A), (a)(2)(B), and (a)(2)(C), respectively, to be consistent with the numbering convention of Title 8.
- To correct the existing numbering format of subsection (c)(1)a. to subsection (c)(1)(A) to be consistent with the numbering convention of Title 8.
- To render the exception to subsection (c)(1)(A) to be as effective as the federal standard, 29 CFR 1910.269(d)(1)(i) by stating that the exception only applies to line clearance operations. Board staff proposed this modification in consultation with Federal OSHA.
- To correct the existing numbering format of subsection of (c)(1)b. to subsection (c)(1)(B) to be consistent with the numbering convention of Title 8.
- To modify the exception to clarify that the exception applies to subsection (c)(1)(B).

Section 2940.11. Protection From Flames and Electrical Arcs.

The proposal is modified as follows:

- To modify subsection (b) to clarify that the employer shall not select apparel that could melt onto the employee's skin.
- To modify subsection (d) by adding the word "energized" in front of the phrase "covered (noninsulated) conductors" and in front of the phrase "covered (noninsulated) wires" to clarify that the requirements apply to energized conductors that are covered, but the covering is not considered as insulation.

Section 2940.12. Making Connections.

The proposal is modified to delete the EXCEPTION to subsection (a) to render the proposal as effective as the federal standard, 29 CFR 1910.269(l)(6). Board staff proposed this modification in consultation with Federal OSHA.

Section 2940.13. Hazardous Energy Control Procedures.

Subsection (o)(1) is proposed to be modified to require the inspection of the energy control procedures be at least annually for clarity and consistency. This modification is necessary to be consistent with proposed subsection (c)(1)(F).

New Section 2940.17. Disconnecting Capacitors and Means of Discharge.

The proposal is modified to add new Section 2940.17, entitled "Disconnecting Capacitor and Means of Discharge" in Article 36. Work Procedures and Operating Procedures, that contains provisions relocated from proposed Section 2893, which is under Article 29. Capacitors. According to Section 2706(a)(2), Article 29 does not apply to employees who work in the power generation, transmission, and distribution industry (see the exception). The relocation is necessary in order for the standard to apply to employees who work in the power generation, transmission and distribution industry. Board staff proposed the modification in consultation with Federal OSHA.

New Section 2940.18. Current Transformer Secondaries.

The proposal is modified to add new Section 2940.18, entitled "Current Transformer Secondaries" in Article 36. Work Procedures and Operating Procedures, which contains provisions relocated from originally proposed Section 2874(f). Current transformer and secondaries. Existing Section 2874 is under Article 27. Transformers. According to Section 2706(a)(2), Article 27 does not apply to employees who work in the power generation, transmission, and distribution industry (see the exception). The relocation to Article 36 is necessary in order for the standard to apply to employees who work in the power generation, transmission and distribution industry. Board staff proposed the modification in consultation with Federal OSHA.

New Section 2940.19. Series Streetlighting.

The proposal is modified to add new Section 2940.19, entitled "Series Streetlighting" in Article 36. Work Procedures and Operating Procedures, which contains provisions relocated from originally proposed Section 2874(g). Series Streetlighting. Section 2874 is under Article 27. Transformers. According to Section 2706(a)(2), Article 27 does not apply to employees who work in the power generation, transmission, and distribution industry (see the exception). The relocation to Article 36 is necessary in order for the standard to apply to employees who work in the power generation, transmission and distribution industry. Board staff proposed the modification in consultation with Federal OSHA.

Section 2941. Work on or in Proximity to Overhead High Voltage Line.

The proposal is modified as follows:

- To add subsections (i)(2)(D)1., (i)(2)(D)2., and (i)(2)(D)3. These are existing provisions under existing subsection (i)(2)(E) to be relocated under subsection (i)(2)(D) regarding temporary grounds.
- To delete existing subsection (i)(2)(E), which requires grounds every 2 miles from a ground. Federal OSHA concluded that multiple unnecessary redundant grounds can lead to injury and is, therefore, insufficiently protective.
- To withdraw the originally proposed renumbering subsequent to the proposed deletion of subsection (i)(2)(E).

Section 2943. Work on or in Proximity to Underground High-Voltage Cables, Conductors or Equipment.

The proposal is modified as follows:

- To remove the original proposed heading "Work related faults" in subsection (g)(2). The term "work related faults" is not defined and creates confusion.
- To add criterion in subsection (g)(2) to determine the type of work that could reasonably create a fault. The criterion is listed in proposed new subsections (g)(2)(A) and (g)(2)(B). Work practices that could foreseeably lead to penetration of a cable or foreseeably place damaging stresses on the cable jacket or insulation can cause a fault, therefore, work shall be done degenerized.
- To delete the originally proposed NOTES 1. and 2. to subsection (g)(2) and to relocate the language of these NOTES as Item 1. and Item 2. to EXCEPTION No. 2 of subsection (g)(2). Item 2. of EXCEPTION No. 2 includes a regulatory phrase "from penetration once sufficient material has been broken to make the action possible" that was inadvertently omitted from the originally proposed NOTE 2. This modification is necessary because the originally proposed NOTES are informational, and the language in these NOTES need to be regulatory, as exceptions.
- To include a new heading "EXCEPTION No. 1" to the proposed language regarding when service loads and a lack of feasible alternatives require that the cable remain energized, as a result of the proposed new EXCEPTION No. 2.

- To add an EXCEPTION No. 2 which permits work that could potentially cause a fault provided that it is performed by a qualified worker or qualified person under observance of a qualified electrical worker authorized by the utility company. These employees have specialized training that enable them to do the work safely. In addition, the work that is permitted is only allowed if it is in accordance with the three specific work practices under EXCEPTION No. 2 in order to minimize the risk.
- To add Item 1. and Item 2. under EXCEPTION No. 2 which are relocated from the originally proposed NOTES to subsection (g)(2). This modification is necessary because the originally proposed NOTES are informational, and the language in these NOTES need to be regulatory.
- To add Item 3. to EXCEPTION No. 2. of subsection (g)(2) regarding the removal of arc-proofing covering performed in a manner not to impose damaging stresses on the cable insulation or jacket. This exception is from a settlement agreement with Edison and Federal OSHA. Item 3. is in response to the question "How does this provision apply to the operation of removing arc-proofing tape (or similar material) from an energized cable?".

Section 2945. Access and Work Space Requirements.

The proposal is to modify subsection (d) to provide a cross reference to Table 2934 of Section 2934. Existing subsection (d) contains the same requirements as existing Section 2934. This modification is necessary in order to remove duplicative regulations.

Appendix A. WORKING ON EXPOOSED ENERGIZED PARTS.

The proposal is modified to correct typographical errors as follows:

- II. General
  D. Types of exposures. To correct the spelling of "barehand".
- IV. Determining Minimum Approach Distance
  A. Factors Affecting Voltage Stress at the Worksite
  1. System voltage (nominal). To correct the spelling of "per unit".
- Notes to Table 14 through Table 21:
  On Note 1, To delete federal standard "§ 1910.269(l)(3)(ii)" and replace it with "Section 2940.2(a)(1)(A)" and delete "Table R-9" and replace it with the corresponding "Table 2940.2-5".
- Footnotes:
  - Footnote 4: To delete "Table R-3" and replace it with "Table 2940.2-1".
  - Footnote 5: To delete "Table R-3" and replace it with "Table 2940.2-1".
  - Footnote 6: To delete "§ 1910.269" and replace it with "Title 8, Subchapter 5, Group 2".

Appendix E. PROTECTION FROM HAZARDOUS DIFFERENCES IN ELECTRIC POTENTIAL.

The proposal is modified as follows:

- To correct the formula to determine safe body current limits by clarifying the current "I" used in the formula is in milliamps. The formula is listed in the IEEE 1048-2003, Guide for Protective Grounding of Power Lines.

SUMMARY OF AND RESPONSES TO WRITTEN AND ORAL COMMENTS

I. Written Comments

Section 2300. Definitions.
Competent Supervision

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena suggested deleting the proposed addition of "competent supervision" in Section 2300 or convene an advisory committee meeting to discuss the term "competent supervision". He stated that the advisory committee meeting should discuss the intent and rationale for the proposed change. Mr. Pena is concerned that the proposed text would require a minimum two-person crew, a work task that historically has been accomplished by one qualified person and will have significant financial impacts to all California employers.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letter dated March 28, 2017.

Mr. Taylor expressed the same concerns as stated in Mr. Pena's Comment 1 of this section.

Comment 3:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 31, 2017.

Mr. Mackenzie expressed similar concerns as detailed in Mr. Pena's Comment 1 of this section. In addition, he stated that the proposed change in Section 2320.2 using the term "competent supervision" would potentially have a significant impact to the current utility work structure over work that historically has been conducted by one qualified person.

Comment 4:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric (PG&E), by letter dated March 31, 2017.

Mr. Mahan has similar concerns as detailed in Mr. Pena's Comment 1 of this section.

Comment 5:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich has similar concerns as detailed in Mr. Pena's Comment 1 of this section.

Response to Commenters:

The Board accepts the above comments and will modify the proposal to delete the definition of competent supervision in Section 2300.and to delete the term in Section 2320.2.

Section 2300. Definitions.
Minimum Approach Distance

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena suggested modifying the proposed new definition of "Minimum Approach Distance" to read as follows:

> Minimum Approach Distance. The closest distance a qualified person, which includes qualified electrical worker, qualified tree worker, and qualified line clearance tree trimmer may approach ~~an~~ unprotected equipment and energized conductor(s). ~~or a grounded object.~~

Mr. Pena stated that "grounded object" should be deleted because grounded equipment and/or conductors are not subject to minimum approach distances.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letter dated March 28, 2017.

Mr. Taylor proposed the same amendments as stated in Mr. Pena's Comment 1 of this section.

Comment 3:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letters dated March 15, 2017 and March 31, 2017.

Mr. Durham stated that for clarification and correctness regarding the definition of "Minimum Approach Distance", the intent is to identify distances between worker and unprotected and energized conductors. Conductors that are protected by approved insulation, barriers, and/or guarding are not subject to minimum approach distances. Grounded, and therefore, de-energized objects do not have minimum approach distances. Therefore, Mr. Durham suggested the following two different versions of the definition of "Minimum Approach Distance":

> Minimum Approach Distance. The closest distance a qualified person, which includes qualified electrical worker, qualified tree worker, and qualified line clearance tree trimmer may approach an energized and unprotected conductor. ~~or a grounded object.~~
>
> Minimum Approach Distance. The closest distance a qualified person, which includes qualified electrical worker, qualified tree worker, and qualified line clearance tree trimmer may approach an energized-unprotected (noninsulated) conductor. ~~, or a grounded object.~~

Comment 4:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 31, 2017.

Mr. Mackenzie stated that for clarification of the definition of "Minimum Approach Distance", a grounded object should be removed from the definition. Therefore, Mr. Mackenzie requests to amend the proposed definition to read as follows:

> Minimum Approach Distance. The closest distance a qualified person, which includes qualified electrical worker, qualified tree worker, and qualified line clearance tree trimmer may approach an energized and unprotected conductor. ~~or a grounded object.~~

Comment 5:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric (PG&E), by letter dated March 31, 2017.

Mr. Mahan requested to modify the definition of "Minimum Approach Distance" providing the same rationale and using the same language as detailed in Mr. Durham's Comment No. 3 of this section.

Comment 6:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich proposes to modify the proposed definition of "Minimum Approach Distance" using the same language and rationale as detailed in Mr. Durham's Comment No. 3 and Mr. Mackenzie's Comment No. 4 of this section.

Response to Commenters:

The original proposed definition of "Minimum Approach Distance" is consistent with the federal standard and the National Safety Electrical Code (NESC) C2-2012. However, the Board reviewed the comments and modified the proposal by:

- Adding "exposed" in front of "energized" to clarify that the minimum approach distance applies to unguarded energized part.
- Deleting "a grounded object" from the definition. Board staff overlooked deleting "a grounded object" from the definition. "A grounded object" would apply if California proposed to include live-line barehand work regulations found in 29 CFR 1910.269(q) in the proposal.

Therefore, the definition has been modified to read as follows:

> Minimum Approach Distance. The closest distance a qualified person, which includes qualified electrical worker, qualified tree worker, and qualified line clearance tree trimmer may approach an **exposed** energized ~~**or a grounded**~~ object.

Section 2300. Definitions.

Comment 1:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letters dated March 15, 2017 and March 31, 2017.

Mr. Durham suggested adding the term "Wood Pole Fall Restriction Equipment" to be defined as:

> A device that, when properly adjusted and combined with other subcomponents and elements, allows the climber to remain at his or her work position with both hands free, and that fulfills a fall protection function if the climber loses contact between his or her gaffs and the pole while changing locations on the pole.

Mr. Durham believes the inclusion of this definition will add clarity for the workers and employers and ensures these approved safe work practices are incorporated into the rules.

Comment 2:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 31, 2017.

Mr. Mackenzie supports adding the term "Wood Pole Fall Restriction Equipment" using the same definition as stated in Mr. Durham's Comment 1 of this section.

Comment 3:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric (PG&E), by letter dated March 31, 2017.

Mr. Mahan requests to add the term "Wood Pole Fall Restriction Equipment" using the same definition as stated in Mr. Durham's Comment 1 of this section.

Comment 4:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich requests to add the term "Wood Pole Fall Restriction Equipment" using the same definition as stated in Mr. Durham's Comment 1 of this section.

Response to Commenters:

The Board proposes to modify the proposal by adding subsection (c)(3) to Section 2320.8 (Fall Protection) by incorporating ASTM F887-10 by reference. ASTM F887-10, edition approved July 1, 2010, Standard Specifications for Personal Climbing Equipment, is the first edition that contains specifications for "Wood Pole Fall Restriction Equipment".

Section 2320.2. Energized Equipment or Systems.
Subsection (a)(1)

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena is not in favor of the proposal to replace "responsible supervision" with "competent supervision" without an advisory committee meeting to discuss the rationale for the change. See comments regarding the proposed definition of "competent supervision".

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letter dated March 28, 2017.

Mr. Taylor expressed the same concern as Mr. Pena's Comment 1 of this section.

Comment 3:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric (PG&E), by letter dated March 31, 2017.

Mr. Bob Mahan expressed a similar concern as detailed in Mr. Pena's Comment 1 of this section.

Response to Commenters:

Upon further review, the Board has determined that the existing wording "responsible supervision" under Section 2320.2(a)(1) provides sufficient clarity to communicate the intent of the safety order, and has restored the original language.

Section 2320.2. Energized Equipment or Systems.
Subsection (a)(2)

Comment:

Ralph M. Armstrong Jr., Senior Assistant Business Manager, International Brotherhood of Electrical Workers, Local 1245, by letter dated March 31, 2017.

Mr. Armstrong commented on Section 2320.2(a)(2) which contains existing language for which no changes were proposed. Mr. Armstrong is of the opinion that energized electrical work at 600 volts or less should be performed by Qualified Electrical Workers or the very least the person performing the work should be trained in and competent in the work practices and safety requirement of performing energized work.

Response:

The Board notes that Mr. Armstrong's comment regarding subsection (a)(2) is outside the scope of the proposed changes. Subsection (a)(2) does require that personnel receive instructions on the work techniques and hazards involved in working on energized equipment. Subsection (a)(3) requires that suitable personal protective equipment and safeguards are provided and used. The Board suggests that if Mr. Armstrong believes that the language in subsections (a)(2) and (a)(3) does not address competency and training, he may consider submitting a petition.

Section 2320.2. Energized Equipment or Systems.
Subsection (d). Minimum Approach Distance.

Comment 1:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich recommends adding the word "exposed" to subsection (d) as follows:

> (d) Minimum Approach Distance. The employer shall ensure that no employee takes a conductive object closer to energized exposed parts than the established minimum approach distances unless:
>
> *****

Mr. Naglich stated that in order to provide clarity for the workers and the employers, LADWP requests modification to the language of this section to align with the high-voltage counterpart.

Non-exposed energized parts and components do not require the same minimum approach distances as exposed and energized parts.

Comment 2:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letter dated March 31, 2017.

Mr. Durham proposed the same modification and rationale as Mr. Naglich's Comment 1 of this section.

Comment 3:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 31, 2017.

Mr. Mackenzie proposed the same language as stated by Mr. Naglich's Comment 1 of this section. Mr. Mackenzie stated that the inclusion of the term "exposed" after the word "energized" and prior to the word "parts" in subsection (d) would align this subsection with the high-voltage counterpart. Non-exposed energized parts and components do not require the same minimum approach distances as exposed and energized parts.

Response to Commenters:

The Board agrees with the commenters' recommendations and rationale and will modify Section 2320.2(d) to include the word "exposed" before the phrase "energized parts".

Section 2320.8. Fall Protection.
Subsection (a)(1)

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena suggested modifying the proposal by adding the phrase "fall restrict" to Section 2320.8(a)(1) to read as follows:

> (1) Climbing or changing location. Qualified employees climbing or changing locations on poles, towers, or similar structures shall use fall protection or fall restrict equipment.

Mr. Pena stated that many employers and their workers use the nomenclature "fall restrict" when addressing wood pole fall protection devices. Fall restrict devices are manufactured to meet or exceed ASTM F887 and CSA Z259.14 consensus standards, and their function is consistent with requirements as found in Article 2, Construction Safety Orders, Section 1670(c)(1). Personal Fall Arrest Systems, Personal Fall Restraint Systems and Positioning Devices.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letter dated March 28, 2017.

Mr. Taylor suggested the same modifications and provided the same rationale as Mr. Pena's Comment 1 of this section.

Comment 3:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letters dated March 15, 2017 and March 31, 2017.

Mr. Durham suggested modifying the proposal by adding the phrase "fall restriction" to Section 2320.8(a)(1) to read as:

> (1) Climbing or changing location. Qualified employees climbing or changing locations on poles, towers, or similar structures shall use fall protection or fall restriction equipment.

Mr. Durham stated that SMUD proposes the inclusion of "fall restriction" equipment to subsection (a)(1). This inclusion allows employers to continue to utilize fall restriction devices, which are readily available and recognized by Federal OSHA as protective devices for those who work on poles. A fall restriction device is designed to limit a worker fall to two feet. This compliance requirement is consistent with Article 2, Construction Safety Orders, Section 1670(c)(1).

Comment 4:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 31, 2017.

Mr. Mackenzie suggested modifying the proposal using the same modified language as Mr. Durham's Comment 3 of this section.

Mr. Mackenzie stated that this modified change includes the use of approved fall restriction equipment into this definition.

Comment 5:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric (PG&E), by letter dated March 31, 2017.

Mr. Mahan suggested modifying the proposal using the same language and rationale as Mr. Durham's Comment 3 of this section.

Comment 6:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich suggested modifying the proposal using the same language and rationale as Mr. Durham's Comment 3 of this section.

Response to Commenters:

The Board has modified the proposal to add "fall restriction equipment" to subsection (a). The proposal is also modified to add the definition of "fall protection" in Section 2300. Definitions, to be defined as "any equipment, device, or system that prevents an employee from falling from an elevated location or mitigates the effect of such a fall". This new definition is from federal standard 1910.21(b) and ANSI Z359.0-2007, Fall Protection Code. "Wood pole fall restriction equipment" is a type of fall protection equipment.

Section 2320.11. Protection From Flames and Electric Arcs.
Subsection (d). Covered (Noninsulated) Conductors.

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena stated that subsection (d) is confusing because the reader first sees "Covered", which is defined in Section 2700. Definitions, when addressing conductors. "Covered" is defined as a conductor encased within material of composition or thickness that is not recognized by these safety orders as electrical insulation. Mr. Pena further stated that there is also an important distinction when assessing single and/or three phase electrical exposures, as personal protective equipment requirements relative to head and face protection may differ.

Mr. Pena offered a different heading and alternative language for Section 2320.11(d) for clarity:

> (d) ~~Covered~~ Energized (~~Noninsulated~~ Unprotected) Conductors. The requirements of this section that pertain to the hazards of exposed live parts also apply when an employee performs work in proximity to ~~covered~~ energized (~~noninsulated~~ unprotected) wires.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letter dated March 28, 2017.

Mr. Taylor expressed the same concerns and, provided the same alternative language as Mr. Pena's Comment 1 of this section.

Comment 3:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letters dated March 15, 2017 and March 31, 2017.

In an effort to provide clarity involving employees working in proximity to unprotected conductors, Mr. Durham proposed the following two versions:

Letter dated March 15, 2017 Version:

(d) ~~Covered~~ Energized and~~(Noninsulated)~~ Unprotected Conductors. The requirements of this section that pertain to the hazards of exposed live parts also apply when an employee performs work in proximity to ~~covered~~ energized ~~(noninsulated)~~ unprotected wires.

Letter dated March 31, 2017 Version:

(d) ~~Covered~~ Energized-Unprotected (Noninsulated) Conductors. The requirements of this section that pertain to the hazards of exposed live parts also apply when an employee performs work in proximity to ~~covered~~ energized-unprotected (noninsulated) wires.

Comment 4:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letters dated March 14, 2017 and March 31, 2017.

Mr. Mackenzie recommended the same language for subsection (d) as Mr. Durham's letter dated March 31, 2017 noted in Comment 3 of this section. Mr. Mackenzie noted that the word "covered" is a term that can be used in the electrical industry that is inconsistent with the term "non-insulated".

Response to Commenters:

The Board accepts the preceding comments and proposes to modify the proposed language by adding the word "Energized", but not striking-out the word "covered" in the proposed text and the heading of subsection (d). The Board notes that the use of "covered (noninsulated) conductors" is consistent with the existing definition in Section 2300.

Conductor.
(A) Bare. A conductor having no covering or electrical insulation whatsoever. (See "Conductor, Covered.")
(B) Covered. A conductor encased within material of composition or thickness that is not recognized by these Orders as electrical insulation. (See "Conductor, Bare.")
(C) Insulated. A conductor encased within material of composition and thickness that is recognized by these Orders as electrical insulation.

Section 2320.11. Protection From Flames and Electric Arcs.
Subsection (e). Non-Current-Carrying Metal Parts.

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena proposed adding a NOTE to subsection (e) in Section 2320.11(e) for clarity and consistency based on the preamble of the federal final rule. The suggested language for the NOTE is as follows:

NOTE to subsection (e): If the employer properly installs and maintains enclosed equipment and if there is no evidence of impending failure, the risk that an electric arc will occur is low enough that the Division would not deem there to be exposure to electric-arc hazards. For the purposes of this section, Division will consider an employee "exposed" to electric–arc hazards whenever there is a reasonable likelihood that an electric arc will occur in the employee's work area.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letters dated March 10, 2017 and March 28, 2017.

Mr. Taylor's letter dated March 10, 2017, he expressed a concern that the proposal creates a new ground to ground requirement to wear rubber gloves when exposed to energized equipment. This could potentially include work on pad-mounted transformers.

Mr. Taylor's letter dated March 28, 2017, he suggested adding a NOTE to Section 2320.11(e) as suggested by Mr. Pena in Comment 1 of this section.

Comment 3:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letters dated March 15, 2017 and March 31, 2017.

Mr. Durham requests an advisory committee of stakeholders be assembled for the purposes of assisting the Occupational Safety and Health Standards Board and their staff in identifying hazards associated with encroaching upon non-current-carrying metal parts of equipment and whether a grounded low voltage conductor and/or transformer-switch case is sufficient grounding for worker protection. This is important to define because all surface operable pad mounted switches, pad mounted transformers, street lights mounted on steel poles and meter pedestals are exposed to the public and workers. SMUD is concerned with the potential implications of treating these non-current-carrying metal parts as energized.

In addition, without further understanding of this requirement and perhaps reshaping of the verbiage consistent with appropriate safe work practices, there is concern that the requirement will cause confusion for those tasked with performing work on this equipment.

Comment 4:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letters dated March 14, 2017 and March 31, 2017.

Mr. Mackenzie expressed similar concerns as detailed in Mr. Pena's Comment 1 and Mr. Durham's Comment 3 of this section and recommends an advisory committee meeting be convened.

Comment 5:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric (PG&E), by letter dated March 31, 2017.

Mr. Mahan expressed similar concerns as detailed in Mr. Pena's Comment 1 and Mr. Durham's Comment 3 of this section and recommends an advisory committee meeting be convened.

Comment 6:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich expressed similar concerns as detailed in Mr. Pena's Comment 1 and Mr. Durham's Comment 3 of this section and recommends an advisory committee meeting be convened.

Response to Commenters:

The Board believes that the proposed language is sufficiently clear without the addition of a NOTE and more importantly, stringent enough to avert the possibility of contact with energized conductors by employees. The Board believes an advisory committee to discuss this issue lacks necessity.

Section 2940. General Provisions.
Subsection (e). Information Transfer.

Comment:

Robert Holshauser, General Foreman/Safety, International Line Builders, by e-mail transmittal dated March 14, 2017.

Mr. Holshouser posed the following questions:

- Why is the federal language of "host employer" not used?
- Of the aforementioned employers, which is the federal standards equivalent of "host employer"?

Response:

The proposed standard is worded differently as compared to the federal standard in order to remain consistent with the existing California standards and avoid confusion. The multi-

employer standard, Section 336.10 was effective in December 31, 1997. Matters involving multi-employer work sites have been enforced and adjudicated using this framework of creating, exposing, controlling, and correcting employers.

The proposed standard requires that the different employers in a multi-employer site communicate with each other and everyone has a shared responsibility in making sure that the work hazards are properly evaluated and ultimately communicated to affected employees. The "host employer" could be the creating, controlling and/or correcting employer depending on the written contract and actual practice.

Section 2940. General Provisions.
Subsection (f). Existing Characteristics and Conditions.
Subsection (f)(1)

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg posed a question, "Is it acceptable under this section for an employer to train and require qualified persons to uniformly make determinations of the existing characteristics and conditions for all types electrical lines and equipment when in proximity to energized electrical conductors?"

Response:

Yes, a designated and qualified electrical worker under the direction of the employer may perform the determination as required in Section 2940(f).

Proposed Section 2940(e), Information transfer, requires that employers in a multi-employer site communicate with each other about the characteristics and conditions of electrical installation in accordance with Section 2940.6(f) to ensure that a proper hazard assessment has been performed prior to performing work.

Section 2700 defines:

> Designated Employee. A qualified person delegated to perform specific duties under the conditions existing.
>
> Qualified Electrical Worker. A qualified person who by reason of a minimum of two years of training and experience with high-voltage circuits and equipment and who has demonstrated by performance familiarity with the work to be performed and the hazards involved.

Section 2940. General Provisions.
Subsection (g). Conductive Articles.

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg asked a question, "Would wearing conductive ear rings or eye glasses be a violation of this requirement?"

Response:

The Board recognizes that an employee wearing conductive articles within reaching distance of exposed energized parts or equipment or in breach of the minimum approach distance would be in violation of Section 2940(g) and possibly Section 2940.2.

Section 2940.2. Minimum Approach Distances.
Subsection (a)(1)(A)

Comment 1:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 31, 2017.

Mr. Mackenzie noticed the following typographical error and submitted the following recommended language:

1. No later than **[OAL will insert this date to be six months from the effective date of the regulation]** for voltages over 72.5 kilovolts, the employer shall determine the maximum anticipated per-unit transient overvoltage, phase-to-ground, through an engineering analysis.

Comment 2:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich noted the same typographical error as noted by Mr. Mackenzie's Comment 1 of this section.

Response to Commenters:

The Board agrees with the commenters and will modify the proposal to correct the typographical error.

Section 2940.2(b). Minimum Approach Distance.

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg asked if "No employee" should be identified as either a "qualified employee" or "the employer"?

Response:

The Board believes encroaching the minimum approach distance of energized exposed or unguarded electrical equipment without proper protection or safeguards would endanger the safety of any individual. Therefore, no modification to this proposal to address this issue is necessary.

Section 2940.2. Minimum Approach Distance.
Table 2940.2-7

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg recommended modifying the title of Table 2940.2-7 to include "Minimum Approach Distance" to be consistent with the other Tables.

Response:

The Board rejects Mr. Kilburg's recommendation to rename the title of Table 2940.2-7. The Board believes the title of the table should reflect the content of the table. The heading of Table 2940.2-7 is "Altitude Correction Factor" because it contains the altitude correction factors used for adjusting the minimum approach distances for altitudes above sea level. Therefore, the Board believes no modification is necessary.

Section 2940.5. Work Over or Near Water.
Subsection (a) and Subsection (b)

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg inadvertently noted Section 2340.5(a) and Section 2340.5(b) in his letter but probably meant Section 2940.5(a) and Section 2940.5(b), respectively. Mr. Kilburg provided the following recommendations:

- Subsection (a). Provide a cross-reference to Construction Safety Order (CSO), Section 1602.
- Subsection (b). Provide a cross-reference to CSO, Section 1602 or suitable fall protection regulations.

Response:

The Board notes that the High-Voltage Electrical Safety Orders (HVESO) are minimum standards for installation, operation, and maintenance of electrical installation and equipment operating above 600 volts. High-voltage work may involve work that falls under the scope of the General Industry Safety Orders (GISO) or the Construction Safety Orders (CSO). The GISO or CSO apply unless there is a more specific standard in the HVESO. Cross-references are provided for added clarity, but it is not necessary to provide a cross reference to every GISO and CSO standard that applies.

The Board will modify Section 2940.5(a) to include a cross-reference to CSO, Section 1602. However, the Board believes no modification is necessary to Section 2940.5(b) as the fall protection requirements are addressed in Section 2940.6(b) and (c).

Section 2940.6. Tools and Protective Equipment.
Subsection (b). Fall Protection.

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg recommended that the proposal cite applicable fall protection standards.

Response:

The Board concurs with Mr. Kilburg and will modify the proposal to provide a cross-reference to Section 1670(b) of the CSO as new subsection (b)(1).

Section 2940.6. Tools and Protective Equipment.
Subsection (c). Linemen's Body Belts, Safety Straps, and Lanyards.

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg recommended to consider organizing these elements in a table for easy reference.

Response:

The Board notes that Board staff reviewed the information contained in Section 2940.6(c) and is satisfied with the format as proposed.

Section 2940.6. Tools and Protective Equipment.
Subsection (c)(2)

Comment 1:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 31, 2017.

Mr. Mackenzie suggested modifying the proposal to permit the use of fall protection equipment that meets an earlier edition of ASTM F 887 to be consistent with the federal requirements: https://www.osha.gov/dsg/power_generation/QandAFinal.html and to clarify new equipment and minimize financial impacts to California employers.

Mr. Mackenzie submitted language below for consideration:

> (2) Personal fall arrest and positioning equipment used by employees who are exposed to hazards from flames or electric arcs, as determined by the employer under Section 2940.11, shall be labeled as meeting ASTM F ~~887-12^{E1}~~ 887-04 or later versions of this standard through ASTM F 887-12^{E1} , Standard Specifications for Personal Climbing Equipment which is hereby incorporated by reference.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letters dated March 10, 2017 and March 28, 2017.

Mr. Taylor provided the same rationale and recommended the same language as that contained in Mr. Mackenzie's Comment 1 of this section.

Comment 3:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letters dated March 15, 2017 and March 31, 2017.

Mr. Durham recommended the same language in both of his letters as Mr. Mackenzie's Comment 1 of this section.

Mr. Durham added that the intent of the proposed regulation is to ensure fall protection devices are manufactured and drop tested with consideration to exposure to flames and electric arcs. ASTM F887-04 fulfills these requirements as found under Section 18.3 Electric Arc Performance. This compliance requirement was addressed by Fed OSHA (see website link in Mr. Pena's Comment 1 of this section).

Comment 4:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena expressed the same concerns as stated in Mr. Mackenzie's Comment 1 and Mr. Durham's Comment 3 of this section and suggested the same language as Mr. Mackenzie's Comment 1 of this section.

Comment 5:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric, by letter dated March 31, 2017.

Mr. Mahan expressed the same concerns as stated in Mr. Mackenzie's Comment 1 and Mr. Durham's Comment 3 of this section and recommended the same language as Mr. Mackenzie's Comment 1 of this section.

Comment 6:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich expressed the same concerns as stated in Mr. Mackenzie's Comment 1 and Mr. Durham's Comment 3 of this section and suggested the same language as Mr. Mackenzie's Comment 1 of this section.

Response to Commenters:

The Board agrees with the above commenters and will modify the proposal as follows:

(c) Linemen's Body Belts, Safety Straps**,** ~~**and**~~ Lanyards**, and Fall Restriction Equipment**.

*****

(2) Personal fall arrest and positioning equipment used by employees who are exposed to hazards from flames or electric arcs, as determined by the employer under Section 2940.11, shall be labeled as meeting ASTM ~~**F 887-12^{E1}**~~ **F 887-04**, Standard Specifications for Personal Climbing Equipment, which is hereby incorporated by reference.

Section 2940.6. Tools and Protective Equipment.
Subsection (d). Portable Ladders and Platforms.

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena stated that the proposed amendment is a misapplication of federal requirements found under §1910.269(h)(2). §1910.269(h)(2) covers special ladders and platforms as defined in ANSI A14.

Special ladders and platforms are designed, constructed and based upon an evaluation performed by a person, firm, or entity with appropriate registered engineering competence or by a person, firm, or entity, independent of the manufacturer or supplier of the product, with demonstrated competence in the field of such evaluation.

This meets the regulatory requirements as found under Section 3206. Approvals. To leave the proposal "as-is" would confuse employers and their workers in having to purchase ladders that are not consistent with current ANSI A14 specifications. Currently, a Type IAA ladder is rated for a maximum of 375 lbs. and is the largest capacity ladder under review by ANSI. Logically speaking, a 200 lb. worker with tools would have to use a ladder rated for 500 lbs. to be compliant. This is not the intent of §1910.269(h)(2).

Mr. Pena recommended modiying the heading of subsection (d) to as follows:

(d) Portable Special Purpose Ladders and Platforms.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letters dated March 10, 2017 and March 28, 2017.

By letter dated March 10, 2017, Mr. Taylor stated that he is not aware of any portable ladder on the market that would be capable of supporting 2.5 times the maximum intended load without failure. The working load of a Special Duty-Class IAA ladder is 375 lbs. A 200 lb. workers would be required to use a ladder rated with a 500 lb. working load in order to comply with this new regulation.

By letter dated March 28, 2017, Mr. Taylor stated that the proposed amendment is a misapplication of the federal requirements regarding portable ladders as found under 29 CFR 1910.269(h)(2). Therefore, Mr. Taylor proposed to modify the heading of Section 2940.6(d) to read: Portable Special Purpose Ladders and Platforms. Mr Taylor provided the same rationale as Mr. Pena's Comment 1 of this section.

Comment 3:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letters dated March 15, 2017 and March 31, 2017.

Mr. Durham stated the ladders and platforms mentioned in the proposal would conflict with:

> §3276. Portable Ladders.
> (c) Design and Construction.
> (4) Portable special purpose ladders that are not covered by one of the ANSI A14 standards referenced in this section shall be designed and constructed in accordance with sound engineering principles and approved per Section 3206.

SMUD recommends the following addition to the heading of subsection (d). Portable Special Purpose Ladders and Platforms. Mr. Durham stated that the clarification will also ensure that the

duty classification found in subsection (d)(2) of Section 3276 remains unaffected. Otherwise, a 200 lb. worker would require a ladder rating of 500 lbs., which is neither commercially available nor recognized by ANSI A14, in order to comply with new requirements. Currently, a Special Duty Type IAA ladder is rated for a maximum 375 lbs.

Comment 4:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letters dated March 14, 2107 and March 31, 2017.

Mr. Mackenzie stated that Section 2940.6(d), as currently written, needs further clarification. Mr. Mackenzie further stated that the proposal, as written, causes provisions that apply only to special purpose ladders and platforms to apply to all portable ladders, which was not the intent of the federal standard.

Therefore, Mr. Mackenzie proposed the following language:

(5) Portable ladders and platforms used on structures or conductors in conjunction with overhead line work shall meet the following requirements:

In configurations in which they are used, portable platforms and ladder shall be capable of supporting without failure at least 2.5 times the maximum intended load.

SCE proposes that this modified provision matches the federal counterpart and applies to special purpose ladders, rather than all ladders.

Comment 5:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric (PG&E), by letter dated March 31, 2017.

Mr. Mahan stated that proposed new Section 2940.6(d)(5) and (d)(6) are in conflict with Section 3276(b) which requires that the ladder selection be determined by the task being performed. PG&E proposes that the Board remove the 2.5 maximum intended load statement and replace it with a statement instructing the reader to comply with the requirements contained in Section 3276. Portable Ladders.

Comment 6:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich stated that the current proposal improperly applies federal language that is specific to a special purpose ladders and platforms to all portable ladders and platforms. Mr. Naglich suggested the following language:

(5) Portable ladders and platforms used on structures or conductors in conjunction with overhead line work shall meet the following requirements:

> In the configurations in which they are used, portable platforms and ladders shall be capable of supporting without failure at least 2.5 times the maximum intended load.

Response to Commenters:

The Board reviewed the above comments and is in general agreement with the commenters. The proposal will be modified to create a new subsection (d)(4) with a heading called "Special ladders and platforms used for overhead line work". This modification will clarify that the ladders and platforms for overhead line work are different with the ANSI approved portable ladders.

The Board is aware that the proposed safety order requires that ladders in whatever configuration they are used to be capable of supporting without failure at least 2.5 times the maximum intended load. The safety factor of 2.5 is a design specification following the same concept that ANSI approved portable ladders (not used for overhead linework) are designed and tested to sustain between 3.2 to 4.0 maximum intended load ladders. See Section 7. Testing Requirements of ANSI 14.2-2007 and ANSI 14.5-2007. Furthermore, 29 CFR 1926.1053(a)(1)(i) states:

> Each self-supporting portable ladder: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this paragraph shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction. Ladders built and tested in conformance with the applicable provisions of Appendix A of this subpart will be deemed to meet this requirement.

Section 2940.6. Tools and Protective Equipment.
Subsection (e). Live Line Tools.
Subsection (e)(2)(A)

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg recommended adding the phrase "prior to use" to the requirement of wiping clean tools.

Response:

The requirement to wipe tools is under subsection (e)(2) as part of the daily inspection to be completed before use each day. Therefore, the Board believes no modification is necessary.

Section 2940.6. Tools and Protective Equipment.
Subsection (e).Live Line Tools.

Subsection (e)(3). Biennial Inspection.
Subsection (e)(3)(D)

Comment:

Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg recommended to add the phrase "shall be verified" prior to the phrase "under wet conditions".

Response:

The Board reviewed Mr. Kilburg's comment and will modify the proposed language to read as follows:

> (e)(3)(D) The test method used shall be designed to verify the tool's integrity along its entire working length and, if the tool is made of fiberglass-reinforced plastic, **the test method shall verify** its integrity under wet conditions.

Section 2940.11. Protection From Flames and Electric Arcs.
Subsection (b). Selection and Prohibited Clothing.
Subsection (b)(2)(B)

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg posed the following question: "Are heavy-duty work shoes or boots" as defined in this rule required to meet ASTM F2413 EH, electrical hazard footwear?"

Response:

"No" as ASTM F2413 EH rating is not required but it would be acceptable. Heavy-duty work shoes or boots is not defined in the safety order. However, according to NFPA 70E, Section 130.7(10)(e).

> 130.7 Personal and Other Protective Equipment
> (10) Arc Flash Protective Equipment
> (e) Foot Protection. Heavy-duty leather work shoes provide some arc flash protection to the feet and shall be used in all exposures greater than 4 cal/m^2

Page 20487 of the Federal Rule:
NFPA 70E recognizes ''[h]eavy-duty work shoes'' as providing ''some arc flash protection to the feet'' and generally requires this type of shoe when the exposure is above 4 cal/cm2 (Ex. 0134).360 As OSHA found no evidence in the record of an employee sustaining burn injuries to

the feet in an arc-related accident, the final rule recognizes the protection afforded by heavy-duty work shoes. Final paragraph (g)(5)(ii) provides that employees wearing heavy-duty work shoes or boots do not need to use arc-rated protection on their feet.

Section 2940.11. Protection From Flames and Electric Arcs.
Subsection (d). Covered (Noninsulated) Conductors.

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena offered an alternative language for Section 2940.11(d) for clarity and to eliminate confusion:

> (d) Energized-unprotected ~~Covered (Noninsulated)~~ Conductors. The requirements of this section that pertain to the hazards of exposed live parts also apply when an employee performs work in proximity to energized-unprotected ~~covered (noninsulated)~~ wires.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letter dated March 28, 2017.

Mr. Taylor proposed the same language as stated in Mr. Pena's Comment 1 of this section.

Comment 3:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric (PG&E), by letter dated March 31, 2017.

Mr. Mahan requested that the term "covered" be replaced with the phrase "energized-unprotected" in subsection (d). PG&E believes that this change in wording adds clarity and will prevent worker and employer confusion. "Covered" is a term that can be used in the electrical industry that is inconsistent with 'non-insulated".

Response to Commenters:

The Board accepts the comments and is proposing to add the word "Energized", but not striking-out the word "Covered" in the heading of subsection (d). The use of "covered (noninsulated) conductors" is consistent with the existing definition in Section 2300.

> Conductor.
> (A) Bare. A conductor having no covering or electrical insulation whatsoever. (See "Conductor, Covered.")
> (B) Covered. A conductor encased within material of composition or thickness that is not recognized by these Orders as electrical insulation. (See "Conductor, Bare.")

(C) Insulated. A conductor encased within material of composition and thickness that is recognized by these Orders as electrical insulation.

Section 2940.11. Protection From Flames and Electric Arcs.
Subsection (e). Non-Current-Carrying Metal Parts.

Comment 1:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letter dated March 28, 2017.

Mr. Taylor suggested adding a NOTE to Section 2940.11(e) based on the preamble of the Federal Final Rule, the preamble of 1910.269(1)(11). The suggested wording of the NOTE is as follows:

NOTE to subsection (e): If the employer properly installs and maintains enclosed equipment and if there is no evidence of impending failure, the risk that an electric arc will occur is low enough that the Division would not deem there to be exposure to electric-arc hazards. For the purposes of this section, Division will consider an employee "exposed" to electric –arc hazards whenever there is a reasonable likelihood that an electric arc will occur in the employee's work area.

Comment 2:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena proposed the same language for a NOTE to follow subsection (e) as stated in Mr. Taylor's Comment 1 of this section.

Response to Commenters:

The Board disagrees with the commenters. There is a strict delineation between standards development responsibility and authority of the Standards Board and the enforcement authority and responsibility of the Division of Occupational Safety and Health (Division). The Board cannot dictate what amounts to Division enforcement policy as far as determining when a non-compliance condition exists. That determination is the exclusive authority of the Division and is determined through their internal policy-making procedures and protocols.

Proposed Section 2940.11(e) derived from 29 CFR 1910.269(l)(11), which did not include the proposed NOTE. In addition, a NOTE is for informational purposes and is not enforceable. Therefore, a NOTE is not the correct method to create a legally binding barometer of when a workplace condition is in a state of non-compliance.

Section 2940.13. Hazardous Energy Control Procedures.

Comment:

Ronald Kilburg, District Safety Officer, El Dorado Irrigation District, by letter dated March 16, 2017.

Mr. Kilburg questioned if this section is consistent with Section 3314? He asked if the Board would consider incorporating Section 3314 by reference and adding any exceptions. Mr. Kilburg believes this would provide clarification to employers implementing and maintaining a lockout/tagout program with both high and low voltage systems.

Response:

Yes. Proposed new Section 2940.13 is consistent with Section 3314, but the two sections are not identical. There are provisions in Section 2940.13 that apply exclusively to the power generation industry. Please see Section 2940.13(a).

Section 2940.13. Hazardous Energy Control Procedures.
Subsection (a). Application.

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena proposed a modification to include other Gas Insulted Systems (GIS) in the application of this section. Mr. Pena's rationale for this proposed modification is that the conductors in the GIS are placed in gas or vacuum vessels for protection and this makes it difficult or impossible to apply personal protective ground when necessary. It is his opinion that the application of Hazardous Energy Control is appropriate in these type of facilities. Mr. Pena submitted the following language which expands the application to gas insulated systems:

(a) Application. The provisions of this section apply to the use of lockout/tagout procedures for the control of energy sources in installations for the purpose of electric power generation and other gas insulated system (GIS), including related equipment for communication or metering. Locking and tagging procedures for the deenergizing of electric energy sources which are used exclusively for purposes of transmission and distribution are addressed in Section 2940.14.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letter dated March 28, 2017.

Mr. Taylor expressed the same concerns and proposed the same language as stated in Mr. Pena's Comment 1 of this section.

Comment 3:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letters dated March 15, 2017 and March 31, 2017.

Mr. Durham raised the same concerns and proposed the same language as stated in Mr. Pena's Comment 1 of this section.

Comment 4:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric, by letter dated March 31, 2017.

Mr. Mahan expressed the same concerns and proposed the same language as stated in Mr. Pena's Comment 1 of this section.

Comment 5:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich expressed the same concern and proposed the same language as stated in Mr. Pena's Comment 1 of this section.

Response to Commenters:

In consultation with Federal OSHA, Gas Insulated Sytsems should be treated as energized or deenergized and isolated, provided the limitations in Section1910.269(n)(2), which are contained in proposed new Section 2940.15(b)(1), (b)(2), and (b)(3) for working without grounds apply. Note that if an employee is going to cut into the cable to work on it, the employee has to evacuate the gas insulation in that section of cable. Therefore, the Board declines to modify the proposal.

Section 2943. Work on or in Proximity to Underground. High-Voltage Cables, Conductors, or Equipment. Subsection (g)(2). Work-related faults.

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena requests that an advisory committee be convened to create a definition for "work-related fault". If the request for an advisory committee is not granted, he recommends adding a NOTE to subsection (g)(2) for clarity and consistency.

> NOTE to subsection (g)(2): These provisions require deenergization only when there is a reasonable possibility that performing the work in question could cause the fault.

> Division considers there to be a reasonable possibility of a fault occurring during the work: (1) if the work practices used could foreseeably lead to the penetration of a cable; or (2) if the work practices used could foreseeably place to her damaging stresses on the cable jacket or insulation, such as bending the cable at an extreme angle.

Mr. Pena posed a scenario that a worker who has met all the training requirements and has demonstrated proficiency in all work task, who may inadvertently cause a "work related fault" through an inappropriate action may presumably necessitate the denergization of the manhole or vault entry. He believes that the proposed requirement is overly broad and may not be achievable due to operating conditions or electrical continuity requirements (e.g., major retail-commercial developments, hospitals, airports, military facilities, fire, and law enforcement stations).

Mr. Pena stated that OSHA has attempted to clarify when a manhole and vault requires de-energization in paragraph (t)(7)(ii) and paragraph (h)(2) of 29 CFR 1926.965. OSHA does not require employers to deenergize cables when there is only a remote possibility that the work employees will perform could cause a fault in a cable.

OSHA requires deenergization only when there is a reasonable possibility that performing the work in question could cause a fault. OSHA considers there to be reasonable possibility of a fault occurring during the work: (1) if work practices used could foreseeable lead to the penetration of the cable; or (2) if the work practices used could foreseeably place other damaging stresses on the cable jacket or insulation, such as bending the cable at an extreme angle.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letter dated March 28, 2017.

Mr. Taylor recommended that an advisory committee be convened to create a definition for "work-related fault". He expressed the same concerns as Mr. Pena described in Comment 1 of this section.

Comment 3:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letters dated March 15, 2017 and March 31, 2017.

Mr. Durham expressed the concerns as stated in Mr. Pena's Comment 1 of this section.

Mr. Durham requested an advisory committee meeting to discuss what can be considered as "work-related faults". He added, as proposed, any system fault, whether at the work location or another unrelated location may require the cables to be deenergized before employee entry.

Comment 4:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric, by letter dated March 31, 2017.

Mr. Mahan expressed the same concerns as stated in Mr. Pena's Comment 1 and Mr. Durham's Comment 3 of this section.

Response to Commenters:

The Board will modify new subsection (g)(2) to clarify the type of work that could foreseeably cause a work-related fault.

Section 2943.1. Enclosed Spaces.

Comment 1:

Larry Pena, Principal Consultant and Owner of Safety Specialties, by letter dated March 24, 2017.

Mr. Pena recommends modifying existing Section 5158. Other Confined Space Operations to meet the federal requirements and to eliminate confusion with Section 5157. Permit-Required Confined Spaces, instead of adding proposed new Section 2943.1. Enclosed Spaces.

Comment 2:

Bill Taylor, Legislative and Regulatory Representative, Public Agency Safety Management Association (PASMA), by letters dated March 10 and March 28, 2017.

By letter dated March 10, 2017, Mr. Taylor stated that certain maintenance work such as epoxy use civil work, water proofing could result in the space being reclassified as a Permit Required Confined Space. In addition, a new subsection (g) has been added which calls for promptly guarding the opening when covers are removed. PASMA requests that an advisory committee be formed in order to discuss the scope, necessity, and feasibility of this proposed change.

By letter dated March 28, 2017, Mr. Taylor recommended deleting the entire proposed Section 2943.1 and modifying Section 5158 to meet the federal requirements.

Comment 3:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letter dated March 15, 2017.

Mr. Durham stated that the proposed new Section 2943.1 can be eliminated as Section 5158 contains all the required elements as proposed new Section 2943.1, making it at least as effective as the federal standard.

Comment 4:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letters dated March 14, 2017 March 31, 2017.

Mr. Mackenzie is requesting that an advisory committee be convened. The committee can discuss regulations that cover Permit-Required Confined Spaces and Confined Spaces in Construction and ways to incorporate safe work practices from Section 5158. Other Confined Space Operations into the new proposed section.

Furthermore, SCE recommends that the adoption of Section 2943.1 be withheld in the short-term. The advisory committee meeting can aid the Board staff in the demonstration of equivalency of existing regulations, either as currently written or with moderate updates to existing requirements. The advisory committee meeting will ensure a clear understanding of both the rationale for the introduction of this new section and that all existing provisions are adequately considered in the development of this new section. The work product of this advisory committee will likely prove valuable to the upcoming Confined Spaces in Construction advisory committee.

Alternatively, if this section is adopted without further consideration, California employers will be required to develop and train employees and then, over the following months, companies will likely be required to update programs and retrain workers when Confined Spaces in Construction is amended. Changes of this nature undoubtedly confuse workers, and have the potential of leading to a decreased level of safety. Therefore, SCE believes that the best solution would be to continue to leverage California's Other Confined Space Operations, while partnering to either prove equivalency of these existing requirements or collaboratively develop new provisions in a manner that will best align with the future work related to the Confined Spaces in Construction regulations.

Comment 5:

Bob Mahan, Expert Safety Specialist, Pacific Gas and Electric (PG&E), by letter dated March 31, 2017.

PG&E recommends an advisory committee meeting to be convened to ensure clarity between the application of the provisions of new Section 2943.1 versus other Title 8 regulations that govern Permit-Required Confined Spaces and Confined Spaces in Construction.

Comment 6:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich expressed the same concerns as stated in Mr. Mackenzie's Comment 4 of this section.

Response to Commenters:

The comments received did not provide details regarding specific deficiencies in the proposal that warrants an advisory committee meeting. Therefore, the Board declines to modify the proposal.

Section 2944. Work on or in Proximity to Conductors and Equipment Located in High-Voltage Stations, or Switchyards.

Comment:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 14, 2017.

Mr. Mackenzie stated that within Section 2944, the term "work" is broadly used. While SCE assumes the word is intended to involve work on or near electrical systems, the term, as written, leaves the opportunity for varying interpretations. Therefore, Mr. Mackenzie recommends an advisory committee be convened to provide a clear and reasonable definition of the word "work".

Response:

Mr. Mackenzie comment is outside the scope of this rulemaking.

Appendix A
Working On Exposed Energized Parts

Comment 1:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 31, 2017.

Mr. Mackenzie noticed the following typographical errors and submitted the following recommended language for:

- Page 106 of 182 of the original proposed text:
  II. General
  D. *Types of exposures.* Employees working on or near energized electric power generation, transmission, and distribution systems face two kinds of exposures: Phase to-ground and phase-to-phase. The exposure is phase-to-ground: (1) With respect to an energized part, when the employee is at ground potential or (2) with respect to ground, when an employee is at the potential of the energized part during live-line barehand work, which requires a permanent variance. The exposure is phase-to phase, with respect to an energized part, when an employee is at the potential of another energized part (at a different potential) during live-line ~~bareh and~~ barehand work.

- Page 114 of 182 of the original proposed text:
  IV. Determining Minimum Approach Distances
  A. *Factors Affecting Voltage Stress at the Worksite*

1. *System voltage (nominal).* The nominal system voltage range determines the voltage for purposes of calculating minimum approach distances. The employer selects the range in which the nominal system voltage falls, as given in the relevant table, and uses the highest value within that range in ~~perunit~~ per unit calculations.

- Page 138 of 182 of the original proposed text;
  Notes to Table 14 through Table 21:
  1. The employer must determine the maximum anticipated per-unit transient overvoltage, phase-to ground, through an engineering analysis, as required by ~~§ 1910.269(l)(3)(ii)~~ Section 2940.2(a)(1)(A), or assume a maximum anticipated per-unit transient overvoltage, phase-to-ground, in accordance with Table 2940.2-5 ~~Table R-9~~.

- Page 138 of 182 of the original proposed text:
  Footnotes for Appendix A:
  [6] For the purposes of estimating arc length, ~~§ 1910.269~~ Title 8, Subchapter 5, Group 2 generally assumes a more conservative dielectric strength of 10 kilovolts per 25.4 millimeters, consistent with assumptions made in consensus standards such as the National Electrical Safety Code (IEEE C2-2012). The more conservative value accounts for variables such as electrode shape, wave shape, and a certain amount of overvoltage.

Comment 2:

Frank C. Naglich, Chief Safety Officer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich noted the same typographical errors as stated by Mr. Mackenzie's Comment 1 of this section.

Response to Commenters:

The typographical error have been corrected.

Section 3422. Ropes and Tree Worker Climbing Equipment.

Comment:

Bradley Closson, Owner, Craft Forensic Services, by e-mail transmittal on January 30, 2017.

Mr. Closson recommended removing the requirement for storing the rope coiled and piled or suspended, so that air can circulate through the coils. He stated that ropes are required to be inspected before use for any deterioration. He said ropes that are coiled and piled or suspended in an enclosed space will have less air exposure than ropes that are laying on exposed dry surfaces. Mr. Closson stated the term "storage" is not defined. He also asked what amount of air flow is expected and what is the acceptable size and location of a coil and pile?

Response:

The requirement that when ropes are stored, ropes shall be coiled and piled or suspended is consistent with the existing requirement in Section 3422(i) that rope and climbing equipment shall be stored and transported in a manner that prevents damage by contact with sharp tools and cutting edges, gas, oil and chemicals. If the rope is not thrown away after use, then the rope is stored. Storing the rope in a suspended manner would allow the moist rope to dry. As far as an acceptable location, the employer can store the rope any place that would minimize or prevent physical and chemical damage to the rope. The proposal is silent with regard to the size of the coil and pile.

Effective Date

Comment 1:

Barry Moline, Executive Director, California Municipal Utilities Association (CMUA), by letter dated March 31, 2017.

CMUA is urging the Board to establish a one-year implementation period to allow for sufficient time to develop new training programs and update work procedures. The proposed changes will impact a broad array of electric utility operations, covering a large number of employees. In light of this scale, it is essential that the utilities have the opportunity to implement these new changes in a measured and coordinated fashion. Additionally, CMUA supports the creation of an advisory committee that can provide input on the scope, feasibility, and necessity of the proposed changes.

Comment 2:

James Mackenzie, Principal Manager, Corporate Safety Programs, Southern California Edison (SCE), by letter dated March 31, 2017.

Mr. Mackenzie stated that with respect to the implementation timelines for the varying components of this proposal, SCE requests consideration be given to the vast number of changes included in this proposal. Many of these changes will require updates to company and work group policies and procedures. Tools and equipment will likely need to be procured and distributed. Furthermore, training materials will need to be developed and delivered to workers across their service territory, based upon updated policies and procedures. SCE's current training model which is not uncommon for utilities, involves delivery of employee compliance training to all employees across SCE's service territory, over a twelve-month timeframe. This process ensures both the appropriate training of affected workers and avoids adverse impacts to reliability of critical services provided by SCE.

Therefore, based upon the multiple actions required and the current training model of delivering training across SCE"s various locations, SCE requests a twelve-month timeframe for implementing all proposed changes that involve a training component.

Comment 3:

Frank C. Naglich, Chief Safety Offficer, Los Angeles Department of Water and Power (LADWP), by letter dated March 31, 2017.

Mr. Naglich provided the same concerns as Mr. Mackenzie's Comment 2 of this section.

Response to Commenters:

The Board is restrained by the Labor Code requirement regarding mandatory adoption of state standards that are as effective as those promulgated by Federal OSHA. The extension of the implementation or effective date of the proposal beyond that prescribed by the federal standard is not as effective, as the delay in the implementation of the regulation could result in additional employees unprotected by one or more provisions of this proposal and exposed to electrical hazards. Therefore, the Board declines to extend the compliance dates.

Please see the response to written comments under the "General Request for an Advisory Committee" section.

General Request for an Advisory Committee

Comment 1:

Andrew Stephens, Safety Committee Chairman, Associated Builders and Contractors, Inc., by letter dated March 16, 2017.

Mr. Stephens recommended that the Board reject the proposed rule changes and convene an advisory committee to review the rule that was noticed to allow for input from end users. He asserts that the federal rules which were the basis for this proposal was not intended to affect general electrical safety work.

Comment 2:

Jeff Gurican, CSP, Health and Safety Advisor, Aera Energy LLC, by e-mail transmittal on March 16, 2017.

Mr. Gurican recommended that the Board reject the proposed regulations and convene an advisory committee for incorporation of the Federal OSHA Special Industry regulations as a set of Cal OSHA special industry regulations within Cal/OSHA Title 8 (primarily Electrical Safety Orders).

Mr. Gurican stated that in the past, advisory committees were convened and he is concerned that this was not done. He believes that the proposed regulations are not in alignment with Federal OSHA adoption of Subpart R Special Industries 29 CFR 1910 Electrical Power Generation Transmission, or Distribution. The intent of the federal proposal was to address a special industry group of electrical power generation and transmission, where the industry practices are significantly different. Subpart S contains regulations for general electrical installation and safe work practices.

Response to Commenters:

The Board believes Mr. Gurican's comment would ultimately lead to an unnecessary format overhaul of the organization of California's electrical safety orders (ESO) which would not be productive. The Board believes this would be tantamount to the adoption of the federal standard verbatim and elimination of existing ESO language. The Board has historically adopted federal standards either verbatim or addressed the federal issue(s) with language that fits into the existing Title 8 regulatory format and renders Title 8 commensurate.

The California Electrical Safety Orders (ESO) are organized differently than the federal standards. The ESO are divided by the voltage of the electrical installation or equipment being worked on: Low-Voltage Safety Orders (50-600 volts) and High-Voltage safety orders. Majority of the orders that apply to Power Generation Transmission and Distribution have been historically placed in the High-Voltage Electrical Safety Orders. The proposed new sections that intended to apply strictly to the Power Generation, Transmission and Distribution are reflected in the scope and/or application of the proposed new sections such as Sections 2940.11, 2940.13, 2940.14, and 2940.15.

II. Oral Comments

Oral comments received at the March 16, 2017 Public Hearing in Sacramento, California.

Comment:

Elizabeth Treanor, Phylmar Regulatory Roundtable and Bill Taylor, PASMA.

Ms. Treanor recommended the following and asked the Board staff to work with stakeholders to resolve these issues:

- In Section 2940.6 regarding portable ladders and platforms, subsection (d)(5) should be deleted and subsection (d) should remain as it is for clarity. It will be difficult for employers to find ladders that support 2.5 times the maximum intended load as is required by this subsection and it will confuse workers if the load limit in the regulations is different from what is listed on the ladder. It is also inconsistent with Section 3276. Bill Taylor, PASMA, echoed this in his comment.

- In Section 2940.11 regarding protection from flames and electric arcs, the term "covered" and "noninsulated conductors" are two different terms and are not recognized by workers. The terms "energized" and "unprotected" should be used instead because they are much clearer for the workers and the employers.

Response:

Please see the response to written comments regarding Section 2940.6(d) and Section 2940.11(d).

Comment:

James Carlile, Southern California Edison.

Mr. Carlile believes more work needs to be done on this proposal to make it clearer, and his organization is interested in working with the Board staff through an advisory committee to help do that. He said that his organization does not object to the concepts in the proposal, but further discussion with California utilities and other stakeholders is necessary to ensure clarity and comprehension, and further discussion of the following items will ensure greater compliance and worker safety.

- In Section 2940.6(d) regarding portable ladders and platforms, further clarification is needed regarding the provision that portable ladders and platforms shall be capable of supporting at least 2.5 times the maximum intended load.

- In Section 2320.11(e) regarding non-current carrying metal parts, further clarification is needed and may require reshaping the verbiage because the verbiage will cause confusion for those working on this type of equipment.

- In Section 2944, the term "work" is broadly used throughout the section and leaves room for varying interpretation. This can be cleared up through a definition or alternative language.

- In Section 2943.1 regarding enclosed spaces, there is a level of confusion among industry representatives regarding the introduction of this section and the elimination of the broadly and successfully used other confined space provisions that have been utilized in the electric utility industry. There needs to be more discussion to ensure that the intent of this addition is met and safety factors are enforced.

- In Section 2940.11(b) regarding protection from flames and electric arcs, the term "covered" should be replaced with the phrase "energized unprotected". This will provide clarity without altering the intent of the proposal.

Response:

Please see the responses to written comments regarding Section 2320.11(e), Section 2940.6(d), Section 2940.11(d), and Section 2943.1. The section title of Section 2944 "Work on or in Proximity to Conductors and Equipment Located in High-Voltage Stations, or Switch yards" is not proposed to be modified, and therefore, is outside the scope of this rulemaking.

Comment:

Ralph Armstrong, IBEW 1245.

Mr. Armstrong stated that his organization has some concerns about this proposal and would like to see an advisory committee convened to discuss this. He said that all voltage levels are lethal, so the likelihood of an injury occurring should not be defined by the voltage – it should be

determined by the employee's level of training and competency in the work. He stated that the language in Section 2320.2 regarding energized work is weak and should, at a minimum, require that the work be performed by an employee who is trained and competent in the work practices and safety requirements for performing energized work.

Response:

Existing Section 2320.2 (a)(2) requires that personnel involved in energized work receive instructions on the work techniques and hazards involved in working on energized equipment.

The proposed revisions to Section 2320.2 largely remain unchanged. The only proposed changes to Section 2320.2 are updates to editions of the consensus standard for insulating gloves and sleeves, which were already incorporated by reference. These proposed changes are necessary to be consistent with the proposed changes in Section 2940.6 regarding personal protective equipment. The proposed change to use the term "competent" supervision instead of "responsible" supervision will be withdrawn.

Comment:

Bill Taylor, Public Agency Safety Management Association (PASMA).

Mr. Taylor stated that more work needs to be done on this proposal, and it would be beneficial to convene an advisory committee to determine the scope, necessity, and feasibility of this proposal. He said that this proposal needs more clarity and understanding, and employers need to make sure that employees have the right equipment to do the job and that they understand what they need to do to comply with this regulation.

Response:

The Board believes that Mr. Taylor needs to be more specific regarding his comments. Therefore, convening an advisory committee lacks necessity.

Comment:

Robert Holshauser, International Line Builders.

Mr. Holshauser stated that his organization has questions about information transfer. He said that his organization is concerned because the multi-employer language in the current standard does not accomplish Federal OSHA's goal of recognizing who the responsible party is. He said that the federal standard calls the responsible party the "host employer" and all other employers the "contracted employers". He stated that many utilities contract out their projects, and it is important to identify who the host employer is on the project.

Response:

It is necessary for the proposal to be consistent with the existing regulations in California. California is relying on Section 336.10 for multi-employer sites.

MODIFICATIONS AND RESPONSES TO COMMENTS RESULTING FROM THE 15-DAY NOTICE OF PROPOSED MODIFICATIONS

No further modifications to the information contained in the Initial Statement of Reasons are proposed as a result of the 15-Day Notice of Proposed Modifications mailed on October 11, 2017.

Summary and Responses to Written Comments:

Comment 1:

Patrick Durham, Director, Environmental, Safety & Real Estate Services, Sacramento Municipal Utility District (SMUD), by letter dated October 27, 2017.

Mr. Durham is not in favor of the introduction of the new term "enclosed space" and proposed new Section 2943.1. He stated that the use of the term "enclosed space" will require all industries affected to change the terminology in their training materials and company documentation.

SMUD prefers the status quo, for the electrical utility company to use procedures in Section 5158. Other Confined Space Operations. He is of the opinion that Section 5158 is as effective as 1910.269(e) and (t). Enclosed Spaces. If the status quo cannot be preserved, he suggested changing the section title of Section 2943.1 to "Enclosed Spaces or Other Confined Spaces".

He also noted that the telecommunication industry is currently permitted to work under Section 5158. He is of the opinion that requiring two different industry to work under two different safety orders would cause confusion.

Response:

This comment is outside the scope of the 15-Day Notice. However, the addition of Section 2943.1 is proposed in order to be as effective as the federal standard. Section 2943.1 strictly applies to qualified electrical workers performing work in a confined space, typically manholes and vaults. This section contains additional requirements not found in Section 5158 due to the hazardous nature of underground electrical work. Section 2943.1 requires the following:

- The employer provides equipment to ensure prompt and safe rescue of employees.
- Evaluation of conditions to make sure it is safe to remove the cover.
- The written operating procedures of the enclosed space program must be consistent with the requirements of Section 2943(b).

In addition, to change the title of Section 2943.1 may cause confusion because Section 5158 is entitled "Other Confined Space Operations". Given the Board must adopt standards that are commensurate with those of Federal OSHA, no further modification of the proposal will be made.

However, Labor Code Section 142.2 permits members of the public to petition the Board on matters of occupational safety and health or to propose new or revised regulations.

Comment 2:

Brian Heramb, CIH FAIHA, Senior Industrial Hygienist, San Diego Gas and Electric (SDG&E), by e-mail transmittal, dated October 27, 2017.

Mr. Heramb suggested re-evaluating the incorporation of Section 2943.1. Enclosed Spaces, in light of existing Title 8 regulations (Sections 5157, 5158, and 8616). He stated that introducing "enclosed spaces" adds another term to confined space operations. SDG&E requests that the regulatory text use the term "confined spaces". He also suggested changing the title of Section 2943.1 to "Confined Spaces In Electric Transmission & Distribution".

In addition, SDG&E suggested amending Section 2943.1 (g) to state:

> (g) Removing Covers. When covers are removed from enclosed spaces, the opening shall be promptly guarded by a railing, temporary cover, ~~or~~ other barrier, or other effective means designed to prevent an accidental fall through the opening and to protect employees working in the space from objects entering the space.

Response:

This comment is outside the scope of the 15-Day Notice. However, the Board will not revise Section 5158 because SDG&E's proposed changes to Section 5158 would affect other industries outside of the electric power generation, transmission, and distribution industry, such as agriculture, marine terminal operations, grain handling operations, and natural gas utility companies. The proposed Section 2943.1 contains the existing provisions of Section 5158 and the additional provisions required by the federal standard. Given the Board must adopt standards that are commensurate with those of Federal OSHA, no further modification of the proposal will be made. However, Labor Code Section 142.2 permits members of the public to petition the Board on matters of occupational safety and health or to propose new or revised regulations.

The Board rejects the addition of the phrase "or other effective means" due to the vague nature of the term "effective means".

Comment 3:

Bob Mahan, CSP, Safety Specialist Expert, Corporate Safety and Health, Pacific Gas and Electric, by letter dated October 27, 2017.

Mr. Mahan is requesting that the Board convene an advisory committee meeting to discuss ways to incorporate Section 2943.1 into Section 5158. However, if the Board does not direct staff to convene an advisory committee meeting, he proposed a change to the title of Section 2943.1 to read as follows:

> §2943.1. Enclosed Spaces or Other Confined Space(s).

Response:

This comment is outside the scope of the 15-Day Notice. However, to change the title of Section 2943.1 may cause confusion because Section 5158 is entitled "Other Confined Space Operations". Given the Board must adopt standards that are commensurate with those of Federal OSHA, no further modification of the proposal will be made. However, Labor Code Section 142.2 permits members of the public to petition the Board on matters of occupational safety and health or to propose new or revised regulations.

Comment 4:

James Mackenzie, CSP, Principal Manger, Corporate Health & Safety - Safety Programs, Southern California Edison, by letter dated October 27, 2017.

Mr. Mackenzie raised the same concerns as stated in Mr. Durham's Comment 1.

Response:

See the response to Comment 1.

ADDITIONAL DOCUMENTS RELIED UPON

- American Society for Testing and Materials International (ASTM) F887-91, Standard Specifications for Personal Climbing Equipment, current edition approved January 25, 1991.

This document is available for review Monday through Friday from 8:00 a.m. to 4:30 p.m. at the Standards Board Office located at 2520 Venture Oaks Drive, Suite 350, Sacrament, California.

ADDITIONAL DOCUMENTS INCORPORATED BY REFERENCE

- American Society for Testing and Materials International (ASTM) F887-04, Standard Specifications for Personal Climbing Equipment, current edition approved January 1, 2004.

- ASTM F887-10, Standard Specifications for Personal Climbing Equipment, current edition approved July 1, 2010.

These documents are too cumbersome or impractical to publish in Title 8. Therefore, it is proposed to incorporate the documents by reference. Copies of these documents are available for review Monday through Friday from 8:00 a.m. to 4:30 p.m. at the Standards Board Office located at 2520 Venture Oaks Way, Suite 350, Sacramento, California.

DETERMINATION OF MANDATE

These standards do not impose a mandate on local agencies or school districts.

ALTERNATIVES CONSIDERED

The Board invited interested persons to present statements or arguments with respect to alternatives to the proposed standard. No alternative considered by the Board would be (1) more effective in carrying out the purpose for which the action is proposed; or (2) would be as effective as and less burdensome to affected private persons than the adopted action, or (3) would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law. Board staff were unable to come up with any alternatives or no alternatives were proposed by the public that would have the same desired regulatory effect.